July 17, 1989

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Support Product Marketing
Apple Computer, Inc.

Macintosh Technical Bulletin
JULY-AUGUST 1989 DISK CONTENTS

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Macintosh

TECHNICAL BULLETIN

July–August 1989   Issue 5

FEATURE ARTICLES

TECH SHEETS

DEPARTMENTS

Viruses: What They Are and What You Can Do About Them

A computer virus is a program with two distinct functions:

- It spreads itself from machine to machine through applications. Self-reproducing code infects other systems and stashes itself away in as many "carriers" as possible.

- It implements the "symptoms" planned by the virus perpetrator—with any number of results, including such malicious ones as erasing a disk on a specific date.

Clearing Up Some Misconceptions

Computer viruses aren't a new phenomenon; they've been around for almost as long as computers have. John Van Neumann, the father of the modern computer, experimented with the idea of self-reproducing computer code as early as 1948. And in the late 1970s, there was even a training ground for writing programs similar to viruses—a popular program featuring an artificial environment that pitted two programs against each other.

Neither are viruses unique to the Apple® Macintosh® and other personal computers. Virus programmers also target mainframes and minicomputers. One recent well-publicized incident involved a virus that invaded ARPAnet, a national network that consists mostly of UNIX machines. Taking advantage of a common mail program feature, the virus infected thousands of machines on the network.

Not all computer viruses are meant to be damaging; the programmer may only want to prove that he or she can carry out the virus plans, or may simply want the satisfaction of reading about the virus in magazines and on computer bulletin boards. Nevertheless, even a harmless virus can cause problems. The first virus to appear on the Macintosh, for example, was meant to be benign. However, it took up memory and processing time, and caused random side effects such as printing problems and system crashes.
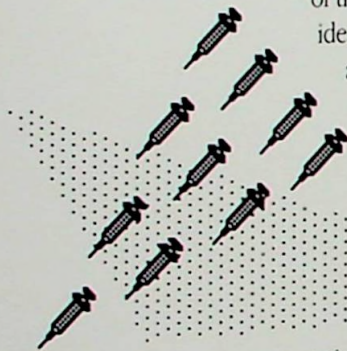
If you suspect that your system has a virus, it's important not to overreact. Take a step back and evaluate the situation calmly. Once you know the virus is there and what it has infected, it's a relatively easy thing to combat. This article gives you enough information to deal with most viruses.

The Great Virus Hunt

When do you suspect a virus? Begin to be suspicious when your computer starts to do unusual things or when it stops doing things it has always done before. For example, you might get a system error when you try to print from an application that's always printed before. Remember, however, that other problems—corrupted system files or printer drivers, for example—can cause such symptoms. It's likely that your problems are the result of nonviral difficulties. Before looking into the possibility that your system has been infected, check out the standard problem areas first.

What to Look For

All applications and all System Folder files are vulnerable to infection by a virus, which can then damage or modify *any* file on the infected

volume or system. Macintosh viruses typically target applications and system files; they usually affect data files only indirectly—by interfering with the normal operation of the machine.

When you've ruled out nonviral causes of your system's problems, the best way to check for known viruses is to use a virus detection utility. A number of available utilities identify infections on a system. Apple provides VirusRX™, and there are also a number of public domain, shareware, and retail products that search through a disk for viruses. They report the presence of known Macintosh viruses and can often detect new ones. Because each utility performs its searches differently, you can use more than one program to make it more difficult for a new virus to slip past your regular checks.
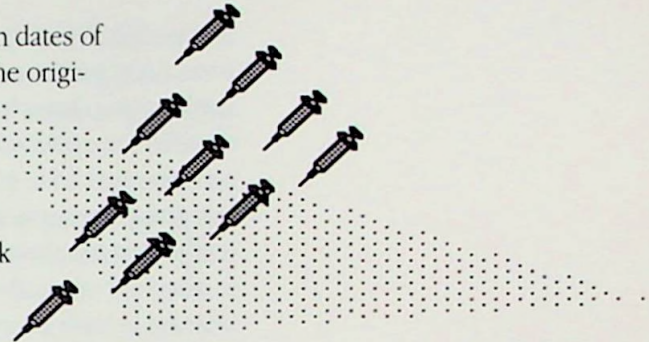
Following is a partial list of sources for various virus detection programs:

— CompuServe
— GEnie
— Delphi
— MacNET
— BITNET
— Local authorized Apple dealer

If you suspect your system might have a virus that is unknown to the detection programs, here are some things you can do:

- Check your System Folder for unfamiliar files.

- Look to see whether copies of your applications are larger than the originals on the master disks. Since viruses append themselves to programs, they almost always increase the size of the program.

- Compare the modification dates of applications to those of the originals. Athough modification dates can change for legitimate reasons—such as maintaining user preferences—a quick date check may provide you with clues.

How Viruses Spread

Most viruses spread through the sharing of software applications. Public domain software and networks particularly aid virus proliferation. Because it is meant to be shared, public domain software is often a carrier—especially through the traffic on on-line services. And although the known Macintosh viruses don't specifically target networks as their transport medium, networks facilitate application sharing, making it possible for a virus to infect multiple workstations in short order.

Infected applications provide the common medium for spreading a Macintosh virus. When you launch an infected application on a Macintosh computer, the viral code in the application checks to see whether the system has been infected. If it hasn't, the virus typically installs itself as an INIT resource in a System Folder file (or files).

When an infected system is booted, the virus installs a background task of some type. Vertical Blanking (VBL) tasks, for example, provide a simple mechanism for installing routines that need to be executed periodically. (An example of a legitimate VBL task is a screen dimmer that periodically checks for user activity.) The background

task installed by an infected system at boot time waits for applications to be launched. When an application is launched, the task checks to see whether the application is already infected; if it isn't, the viral code installs in the application. At this point, the application becomes a carrier, ready to repeat the loop as soon as the application is launched on another system. (Applications are infected in such a way that the viral code goes into action immediately when the applications are launched. In fact, the viral code actually executes the original application code when it has completed its task.)

Some Technical Details

An INIT is a resource that contains executable code. At system startup, specific System Folder files are checked to see whether they contain INIT resources: Control Panel devices (CDEVs), such as General or Mouse; INIT files; or Chooser documents (RDEVs), such as the AppleShare®File Server. If INITs are present in those files or in the System file itself, they are executed. As a matter of fact, one of the INITs in the System file is responsible for the execution of the INITs in the other files in the System Folder. Viruses take advantage of this mechanism by placing INITs within these System Folder files.

When an application is launched, the first code loaded into memory is the jump table, which contains information about what application code should be executed first. A virus changes this information so that the viral code is activated before the application code.

Even viruses that are intended to be "fun" may cause serious problems, because they are not "clean code." A perpetrator who writes code improperly can manage to leave behind many negative side effects—usually because the viral background tasks don't leave the machine exactly as they found it. For example, a background task may be called while an application is in the middle of printing; then, when the application gains control again for more printing, it bombs because the viral background task did not restore the environment to its previous state.

Eradicating an Infection

If you do find a virus, quarantine the infected system immediately. Remove it from any networks, and do not allow floppy disks to be moved from the infected machine to another machine until the infection is eradicated.

Some users think that if they find a virus, they must erase their hard disk drives. This is the equivalent of using a flamethrower to kill a mosquito: It's an unnecessary precaution. If your hard disk is infected, remove the System Folder and the applications, and reinstall them from clean master disks. In the case of very large drives, the process can be tedious; it's reasonable to remove only the System Folder and the applications that have been reported as infected. This method will fail only when the virus detection utility doesn't report all infected applications.

Just as there are utilities that detect viral infections, there are also utilities that remove infections from hard disks. Especially convenient for people who need to remove viruses from multiple machines with hundreds of megabytes of storage,

these programs work reliably against known viruses and are updated regularly to protect against new ones. These virus removal products are available from your local Apple dealer or from a variety of on-line information services.

Be sure to clean up *all* infected disks at an infected workstation. Check all the floppy disks used at the workstation; removing an infection from a hard disk does little good if infected floppy disks are then used on the system.

Important Do's and Don'ts

- Run virus detection utilities from locked floppy disks. *If you use unlocked floppy disks, the utilities themselves can become infected in the process of checking a system.* Using such utilities on another machine then spreads the infection.

- Lock all master application disks. Use only copies, thereby ensuring that clean copies of all applications will be available in case you need them. (Make a habit of this excellent procedure, whether or not your system may be exposed to viruses.)

- Take infected workstations off your network until you've cleaned them up, and isolate all floppy disks used on the infected machines.

- Use a virus detection program to check all disks or applications that come from an unknown source.
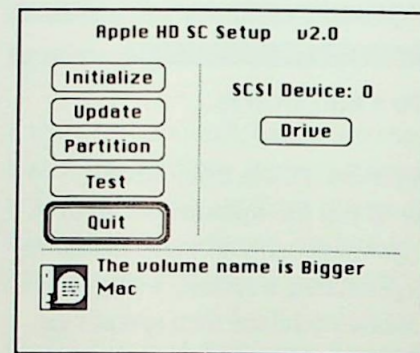
- Have multiple detection and eradication methods available, to create a more virus-hostile environment and to decrease the probability of spreading a virus.

More information on virus detection programs will appear in the upcoming September 1989 Macintosh Technical Bulletin.

Repartitioning an Apple A/UX 80-Megabyte Hard Disk

When you purchase the A/UX® operating system installed on an Apple 80 megabyte hard disk, the disk is configured with a 2.5-megabyte Macintosh partition. Many users have found that 2.5 megabytes of storage isn't enough to contain all their Macintosh applications. This article describes how to move 7 megabytes from one of the A/UX partitions and create one large 9.5 megabyte partition for the Macintosh operating system.
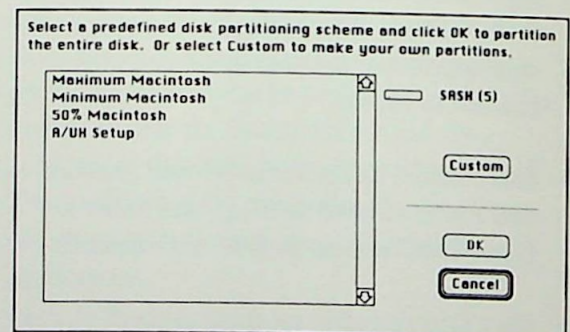
Before repartitioning your drive, make a complete backup of everything on the A/UX hard disk. You can do this from the Macintosh operating system by making a volume backup using an Apple Tape Backup 40SC and Apple Tape Backup Software Version 2.0 or later. A/UX Version 1.1 also allows you to back up the system to tape cartridges from within A/UX. (See the A/UX Version 1.1 *System Administrator's Reference* for details.) The contents of the Macintosh SASH partition will fit on two floppy disks.

Here's what you'll be doing: After making a backup of the hard disk, you'll use HD SC Setup to repartition the disk. You'll need your System Tools disk with HD SC Setup Version 2.0 or later. You'll delete the Swap and Macintosh SASH partitions, then re-create them, this time putting half of the Swap partition into the SASH partition. You'll then reinstall the contents of the Macintosh partition, launch A/UX, and use KCONFIG to tell A/UX how much Swap space is available. Step-by-step instructions follow.
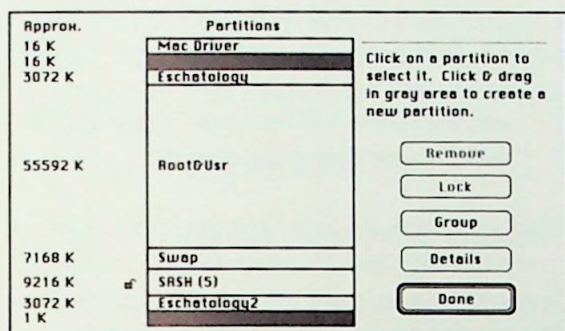
1. Start your Macintosh with the System Tools disk.

2. Launch HD SC Setup.

3. Click Drive until your A/UX drive is selected.
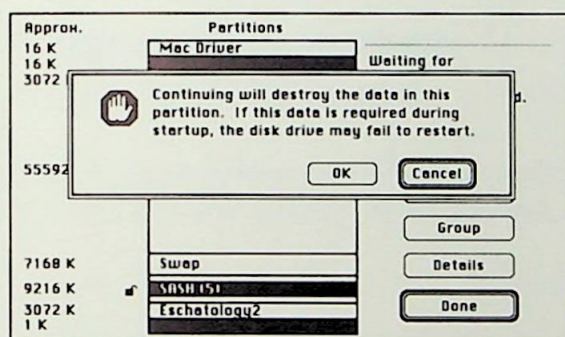
4. Click Open.

5. Click Partition.


```
Apple HD SC Setup    v2.0

Initialize          SCSI Device: 0
Update
                      Drive
Partition

Test

Quit

        The volume name is Bigger
        Mac
```

6. Click Custom for creating custom partitions.


```
Select a predefined disk partitioning scheme and click OK to partition
the entire disk. Or select Custom to make your own partitions.

Maximum Macintosh
Minimum Macintosh                        SASH (5)
50% Macintosh
A/UX Setup
                                          Custom

                                            OK

                                          Cancel
```
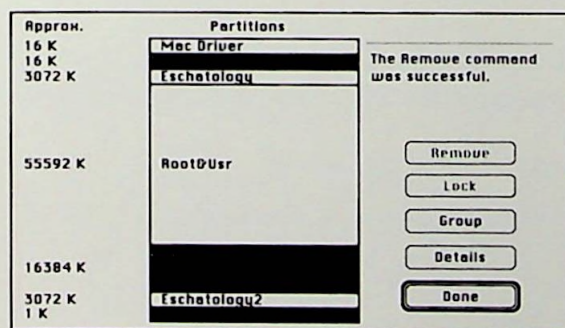
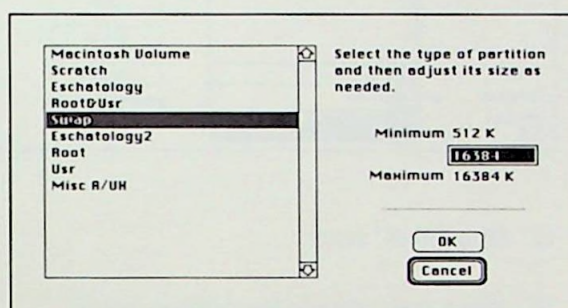You'll see a graphic representation of the partitions on your A/UX drive.

7. Select the Swap partition and click Remove. HD SC Setup will ask you if you really want to delete this partition. Click OK.
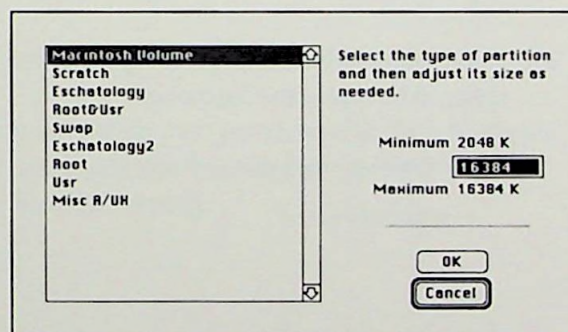

8. Select the SASH partition and click Remove. Again, HD SC Setup will prompt you to confirm your action.
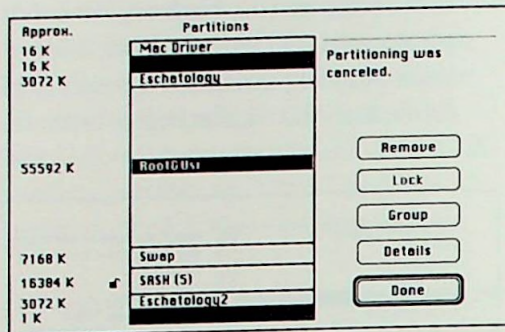

9. Now you'll create a new Swap partition. Click in the area just below the Root&User partition. HD SC Setup lets you choose what kind of partition you want and how big it will be. Select Swap for partition type and enter 7168K for the size. This is half as large as before.

10. Add the SASH partition by clicking in the area just below the Swap partition. Select Macintosh for the partition type and enter the maximum possible size for this partition, 16384K.

11. Click Done.

```
Approx.            Partitions
16 K      | Mac Driver |
16 K      |            |      Partitioning was
3072 K    | Eschatology|      canceled.

                                    [ Remove ]
55592 K   | Root&Usr   |
                                    [  Lock  ]

                                    [ Group  ]

7168 K    | Swap       |           [ Details ]
16384 K  ⌐| SASH (5)   |
3072 K    | Eschatology2|          [  Done  ]
1 K
```

12. Quit HD SC Setup.

13. When you return to the desktop, you'll notice that the Macintosh SASH partition is now 9 megabytes. Reinstall your System Folder, BIN folder, and SASH application.

14. Launch A/UX by double-clicking on the SASH application.

15. Log in as root.

16. Tell A/UX that the size of the Swap space has changed by typing the following:

```
kconfig -n /unix

SWAPCNT=14336

^d
```

The value of SWAPCNT is the number of 512-byte blocks in the partition. It is equal to twice the size of the partition given under HD SC Setup.

17. Changes made to kernel parameters don't take effect until the system is rebooted. Type the following:

```
sync; sync; sync; reboot
```

and the system will be up and running again with 7 megabytes of Swap space.

If you're concerned about how much Swap space you are using, enter the *swap -l* command to see how much Swap space is in use at any given time. The minimum possible Swap space is 2 megabytes. The amount of Swap space you need depends on what you do with your A/UX system. 🍎

A/UX: Automatically Mounting an Extra File System

By default, the A/UX operating system automatically mounts only the root file system. However, if you need more space on your disk drive, or if you're adding another drive for more storage, it is possible to instruct A/UX to automatically mount other user file systems. These instructions assume that your root file system is on a device with SCSI ID 0 and that you have already created another file system on an SCSI device that has SCSI ID 2. If your new file system is located on a drive with a different ID, substitute the appropriate SCSI ID number for "2" in all references to the drive.

Here are the steps you'll follow:

1. Find the name of the partition to be mounted.

2. Permanently associate a slice number with the new file system.

3. Create a mount point.

4. Attach the new file system to the mount point.

5. Create an entry in /etc/fstab to attach the file system to the mount point upon startup.

Find the Name of the Partition

Begin by bringing the system to single-user mode if you're not already there. If you don't know the name of the partition to be mounted, DP can provide it. Type the following:

```
dp /dev/rdsk/c2d0s31
```

DP will respond with a "Command?" prompt. Type **p1** to see whether the partition is the file system you want to mount. If p1 doesn't provide it, try p2, p3, and so on, until you find the right partition. (You're looking for the contents of the field called "Name.") To leave DP, type **Q**.

Permanently Associate a Slice Number

The next step is to associate a slice number with the partition. Check to see if a number has already been assigned by typing **pname**. A/UX will return something like this:

```
/dev/dsk/c0d0s0:  "A/UX Root" "Apple_UNIX_SVR2"  [not in ptab file]

/dev/dsk/c0d0s31: "Entire Disk" "Apple_UNIX_SVR2"  [not in ptab file]
```

The number after the letter *s* in the device name indicates the slice number. Slice 0 is always the root file system. Slice 31 is always the entire disk. Other slice numbers are assigned as needed. You'll need to assign a permanent slice number to the file system you want A/UX to mount automatically.

To assign a temporary slice number to the new partition, type:

```
pname -c2 -s3 "Partition Name"
```

where Partition Name is the name found through DP. PNAME will return something similar to this:

```
/dev/dsk/c2d0s3
```

Now that the partition has a slice number associated with it, make it permanent by creating an entry for it in the file /etc/ptab. Do this by typing the following:

```
pname -p > /etc/ptab
```

Look at the contents of /etc/ptab. They should look something like this:

```
A/UX Root:Apple_UNIX_SVR0:0:0:0

MyFileSystem:Apple_UNIX_SVR2:2:0:3

Entire Disk:Apple_UNIX_SVR2:0:0:31
```

Use VI or some other text editor to remove the line referring to the root file system and the line referring to the entire disk. In the preceding example, you would remove the first and last lines.

<hr>

Create a Mount Point and Attach the New File System

To create the mount point, create a new directory by entering:

```
mkdir /public
```

You can name the mount point anything you like, within the usual rules of A/UX. The new file system will be attached below the directory /public.

To mount the file system, type the following:

```
mount /dev/dsk/c2d0s3 /public
```

This will attach the new file system with slice number 3 to the directory /public. If you change your working directory to /public, you will see your new file system. To confirm that the file system really is mounted, type **mount** to see a list of mounted file systems. You should see something like this:

```
/dev/dsk/c0d0s0 on / type 5.2 (rw,noquota)

/dev/dsk/c2d0s3 on /public type 5.2 (rw,noquota)
```

To make the file system mount automatically on entering multiuser mode, make an entry for the file system in /etc/fstab. Create the entry by typing:

```
mount -p > /etc/fstab
```

Now the file system should automatically mount each time the system enters multiuser mode. To try it, type the following:

```
init 2
```

When the system completes the switch to multiuser mode, log in and confirm that the new file system is in the list of currently mounted file systems by typing **mount**.

Macintosh SE/30 Logic Board Upgrade

In January Apple introduced the Macintosh SE/30, a compact Macintosh computer that provides the processing power of the Macintosh IIx. The Macintosh SE/30 Logic Board Upgrade is now available for Macintosh SE owners who want to upgrade their computers.

The SE/30 logic board contains the Motorola 68030 microprocessor with the built-in PMMU and the 68882 floating-point coprocessor. The board increases the processing speed of the Macintosh SE by up to four times, includes stereo sound capability, and provides support for the Apple FDHD™1.4-megabyte internal drive. (Upgrading to the FDHD drive is optional; Macintosh SE owners who upgrade the logic board can continue to use the 800K drive in their systems.)

Upgrade Program

Owners of any 1- or 4-megabyte Macintosh SE can upgrade to the Macintosh SE/30 by purchasing the Macintosh SE/30 Logic Board Upgrade. Because of the different data bus sizes of the Macintosh SE and SE/30 processors, customers who want to upgrade a 2- or 2.5-megabyte SE computer must purchase an additional 2 megabytes of memory.

The SE/30 logic board supports only one internal floppy disk drive; if the Macintosh SE has two internal 800K drives, one drive must be removed. Third-party kits are available for repackaging the drive for use as an external drive.

The Macintosh SE/30 requires Macintosh System Software Version 6.0.3, which is included with the upgrade.

Upgrade Procedure

Self-servicing customers whose organizations have an Apple Service Certification Course–trained technician on-site can install the Macintosh SE/30 logic board. Otherwise, installation must be performed by an authorized Apple service provider.

Overview: 32-Bit QuickDraw and LaserWriter Version 6.0

32-Bit QuickDraw™ is an extension to Color QuickDraw, the graphics software built into the Macintosh IIx, II, IIcx, and SE/30 computers. 32-Bit QuickDraw extends the 8-bit-per-pixel mode of Color QuickDraw to 16- or 32-bit-per-pixel mode. This enhancement allows the Macintosh to display millions of colors, and makes it possible for Macintosh computers to process and display photo-quality documents and images with exceptional color clarity.

With 32-Bit QuickDraw and a color or gray-scale monitor, you can manipulate 24-bit images using a variety of color painting packages, scanners, and printers that support the new software. The addition of a third-party video card allows you to see—as well as manipulate—the color output.

Also known as Full-Color QuickDraw (FCQD), 32-Bit QuickDraw supports three modes:

- The first mode is the standard Color LookUp Table (CLUT) mode, which is used by standard Color QuickDraw and supports 1-, 2-, 4-, and 8-bit color values.

- The second mode, which uses direct RGB values instead of CLUTs, supports 16-bit direct color values.

- The third mode, which also uses direct RGB values, supports 32-bit direct color values. (Only the first 24 bits are significant; the additional 8 bits of information are typically used by application developers to achieve transparency in applications.)

Hardware Requirements

32-Bit QuickDraw runs on the Macintosh IIx, II, IIcx, and SE/30 computers with System Software Version 6.0.3 or greater. Because color-intensive applications typically require large amounts of memory, Apple recommends at least 2 megabytes of RAM.

To get the full benefits of 32-Bit QuickDraw, you must also have a direct-device video card—that is, a video card that can accept direct color values, instead of receiving a color value that is an index number into a CLUT. (Companies that offer direct-device cards are listed at the end of this article.) However, even if you are not using a direct-device display, you still benefit from the 32-Bit Quick-Draw software, which allows creation of 32-bit images off screen. Programs that take advantage of the full capabilities of 32-Bit QuickDraw can manipulate 32-bit images, regardless of hardware display capability.

Installation

32-Bit QuickDraw consists of the following files, which you place in the System Folder:

- The General CDEV fixes a bug in the desktop pattern editor.

- The Monitors CDEV recognizes direct devices and allows the user to control them.

- The 32-Bit QuickDraw file contains the patches to Color QuickDraw and new versions of the Slot and Palette Managers. This file is not an INIT; however, it uses a new startup file mechanism that was created specifically for 32-Bit QuickDraw and is included in Macintosh System Software Version 6.0.3.

- LaserWriter® 6.0 software includes three files—LaserWriter, LaserPrep, and PrintMonitor—that provide support for color PostScript®, gray-scale printing, full 32-bit addressing, and Kanji PostScript.

Once you've placed all the files in the System Folder, restart the computer and download LaserPrep to the LaserWriter printer. When 32-Bit QuickDraw is properly installed, the Finder™ system presents a multicolored icon for the 32-Bit QuickDraw file, providing you with an easy way to determine whether 32-Bit QuickDraw is running.

Because 32-Bit QuickDraw uses a new version of the LaserWriter driver and LaserPrep, users who want to print to a LaserWriter initialized with the new LaserPrep must update their systems to System Software 6.0.3 and the LaserWriter 6.0 resources. If your hardware doesn't support 32-Bit QuickDraw, you needn't install the new Monitors, General, or 32-Bit QuickDraw files.

LaserWriter Version 6.0

LaserWriter Version 6.0 also includes color extensions. It enables most existing Macintosh applications that use 8-bit color to print on color PostScript printers. Applications that use 32-Bit QuickDraw can produce color output of even higher quality; color transitions are smoother and rendering is more realistic.

The new driver also significantly improves the quality of the black-and-white output produced when color images are printed on LaserWriter printers. (A color or gray-scale Color QuickDraw image printed on a monochrome PostScript printer is halftoned—a technique for producing dot clusters that are perceived as different shades of gray. The output produced is a high-quality, black-and-white image that replicates the differences in color and shading that appear on the screen.)

LaserWriter 6.0 also features faster font query and improved font data structures that decrease the time required to print text documents. This improvement is particularly noticeable when you use numerous fonts that are stored on a hard disk connected to a PostScript printer.

LaserWriter 6.0 is an optional PostScript printer driver. PostScript printer users who print color or gray-scale screen images, or who use numerous fonts, should upgrade to LaserWriter 6.0. You should also upgrade if you share a PostScript printer with other users who have installed LaserWriter 6.0. Most other users can continue to use LaserWriter 5.2, which ships with the current Macintosh system software releases.

RasterOps
2500 Walsh Avenue
Santa Clara, CA 95051
(408) 446-4090

SuperMac Technology
295 North Bernardo Avenue
Mountain View, CA 94043
(415) 964-8884

TrueVision
7351 Shadeland Station
Indianapolis, IN 46256
(317) 841-0332
🍎

Availability

Both 32-Bit QuickDraw and LaserWriter 6.0 are included on the Apple Color Disk, distributed in May 1989 to authorized Apple resellers, electronic bulletin boards, and user groups.

Contact the following companies for information about products that support 32-Bit QuickDraw:

Micron Technology
2805 East Columbia Road
Boise, ID 83706
(208) 383-4000

The LaserWriter II Family at a Glance

The LaserWriter II family incorporates a modular design that provides you with a full upgrade path. All three printers include the same second-generation print engine; they differ only in the type of controller board they contain. Because the controller boards are interchangeable, you can upgrade a LaserWriter IIsc to a LaserWriter IINT or LaserWriter IINTX, and a LaserWriter IINT to a LaserWriter IINTX, while preserving your original investment in the print engine.

LaserWriter IINTX

Resolution: 300 dpi
Fonts: 11 font families (35 typefaces)*
Processor: MC68020; 16.7-megahertz clock speed
RAM: 2 megabytes
Printing
Protocols: PostScript, Diablo 630, and Hewlett-Packard LaserJet Plus emulation
Expansion: RAM expansion up to 12 megabytes; ROM expansion via font expansion slot; SCSI port for adding up to 7 SCSI external hard disks
Networking: Support for the AppleTalk® network system and serial communications

LaserWriter IINT

Resolution: 300 dpi
Fonts: 11 font families (35 typefaces)*
Processor: MC68000; 12-megahertz clock speed
RAM: 2 megabytes
Printing
Protocols: PostScript and Diablo 630 emulation
Networking: Built-in AppleTalk capability

LaserWriter IIsc

Resolution: 300 dpi
Fonts: 4 font families**
Processor: MC68000; 7.45-megahertz clock speed
RAM: 1 megabyte
Printing
Protocols: QuickDraw routines***

*Font families built into the LaserWriter IINTX and IINT include the following: ITC Bookman®, Courier, New Century Schoolbook, Palatino®, Times®, ITC Zapf Chancery®, ITC Avant Garde Gothic®, Helvetica®, Helvetica Narrow®, Symbol, and ITC Zapf Dingbats®.

**Four font families come with the LaserWriter IIsc for installation in the Macintosh System file: Times, Helvetica, Courier, and Symbol.

***The Macintosh uses QuickDraw and a set of 4X ("four times") fonts (such as 48-, 56-, 72-, and 96-point) to do all imaging for the LaserWriter IIsc. The 4X fonts, which are stored in the Macintosh System file, ensure that the resolution image created in the off-screen bit-map corresponds to the resolution of the printer. QuickDraw commands are intercepted and translated by the LaserWriter IIsc driver, which draws each object into an off-screen bit-map in the Macintosh RAM.
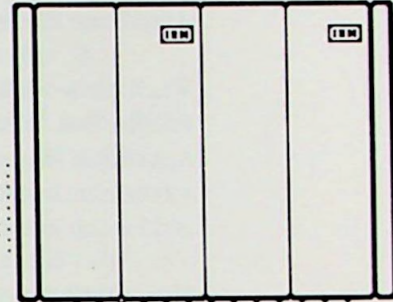
RELAY Baton Displays IBM Mainframe Files

RELAY Baton, from RELAY Communications, Inc., provides error-free file transfer between Macintosh computers (Macintosh Plus and later models) and IBM mainframes. Baton connects to IBM mainframes that run RELAY/VM or RELAY/TSO software, working asynchronously over regular phone lines. No boards or cables are needed.

RELAY Baton graphically represents IBM mainframe files in the same way that Macintosh files are displayed, allowing users to transfer files to and from the mainframe in the usual Macintosh manner—by pointing and clicking on file icons or names. In the MultiFinder™ environment, the product can transfer files in the background while the user runs other Macintosh applications in the foreground.

RELAY/VM software is required when connecting to a VM/CMS mainframe, and RELAY/TSO software is required when connecting to an MVS/TSO mainframe. One installation of either mainframe package serves an unlimited number of Macintosh computers running RELAY Baton.

RELAY Communications, Inc.
41 Kenosia Avenue
Danbury, CT 06810
(203) 798-3800

AppleShare File Server Version 2.0.1 and a Macintosh SE/30 or IIx Server

To avoid server crashes when you use a Macintosh SE/30 or a Macintosh IIx as an AppleShare file server, use Macintosh System Software Version 6.0.3 and AppleShare File Server Version 2.0.1. (Do not use AppleShare File Server Version 1.0 or 1.1.)

When you're ready to install the AppleShare software, do not use the system files on the AppleShare Server Installer Disk. You must first install Macintosh System Software Version 6.0.3, and then install the AppleShare File Server software from the Server Installer Disk. If you use an earlier version of the system software, an Installer problem may cause the system to hang when you quit from the Server Installer Disk and then choose Reset or Restart from the Finder.

The AppleShare File Server Version 2.0.1 update is available to AppleShare owners through the Apple Software Update Program.

AppleScan: Gray-Scale Scans and the LaserWriter

If you set the Apple Scanner to gray-scale composition, you cannot print the resulting scan to the Laser-Writer (the Print command will not be available).

A gray-scale scan is a high-resolution image that uses 4 bits per pixel to depict 16 levels of gray. A halftone scan, by comparison, uses a series of black-and-white dot patterns to represent grays. In effect, each dot in a gray-scale image scanned at a resolution of 300 dpi (dots per inch) can be one of 16 shades of gray. Because the LaserWriter can produce only black dots or white dots, it can't print a scan at gray-scale resolution.

You can convert a gray-scale image to a halftone or to line art. Select the scanned-image window and choose the Converter command from the AppleScan™ File menu. You can then print the converted image on a LaserWriter.

Macintosh II: Resetting Parameter RAM After a Bomb

The following information applies only to Macintosh II systems running system software earlier than Version 5.0. Macintosh System Software Version 5.0 corrected the problem.

When an application crashes, it sometimes executes code that corrupts Parameter RAM. One section of Parameter RAM contains default operating system startup information—directing the Macintosh II to start up from the Macintosh operating system or from A/UX, for example. The Macintosh II won't start up from the internal SCSI drive unless this Parameter RAM section contains the default values.

If you experience this problem after an application crash, reset Parameter RAM to its default values as follows:

1. Hold down the Shift, Option, and Command keys while you open the Control Panel.

2. When the dialog box appears, Click Yes to "zap PRam."

Select the Update option from within the HD SC Setup application to install new SCSI drivers and set Parameter RAM to start up from the Macintosh operating system.

LaserWriter IIsc: Problems in Printing Large Fonts

When you use the 18- and 24-point outline and shadow styles with LaserWriter IIsc 4X fonts, whole words, letters, or parts of letters sometimes fail to print, or print erratically. The problem involves memory—some applications don't allocate enough memory to the printing operation to support outline and shadow styles in large fonts. Increasing the application memory size or leaving the MultiFinder operating system environment won't solve the problem. However, here are a few suggestions that may help:

- When you use outline or shadow styles, apply them to shorter lengths of text. Select one word instead of two or more words, for example.

- Change the style. Plain prints best; Bold prints better than Outline; Outline prints better than Shadow; Shadow prints better than Bold Outline; and so on. The simpler configurations yield better results.

- Change the font. Some fonts print better than others under these conditions.

Seven Steps for a Complete Scan

Follow the steps below to get professional results with the Apple Scanner and AppleScan software:

1. Put the original face down on the scanner's glass surface.

2. In the Scan Control Panel, click Preview.

3. In the Scanner window, adjust the scan area. (Click Zoom if you need to see the scan area magnified.)

4. In the Scan Control Panel, set the Resolution and Composition by selecting Line Art, Halftone, or Gray-scale.

5. In the Scan Control Panel, select the settings for Threshold, Contrast and Brightness, Halftone Pattern, and Graymap.

6. In the Settings window, adjust the settings, then click Apply.

7. In the Scan Control Panel, click Scan.

When the scan is complete, click on the Untitled window (the scanned-image window) and choose Print or Save.

BackFAX: Enhanced AppleFax Modem Operation

Solutions International produces BackFAX, a software application that enhances the operation of the AppleFax™ Modem. When used instead of the AppleFax software, BackFAX offers a number of advantages for power fax users.

- When launched under MultiFinder, the AppleFax Modem software does not support background facsimile transmission and reception. AppleFax must be the foreground application to receive or send files in the MultiFinder environment. However, with BackFAX, the AppleFax Modem can send and receive documents while you continue to work in other applications.

- BackFAX allows you to open a fax document you've received through the AppleFax Modem, copy a part of it to the Scrapbook, or save the whole document as a TIFF, PICT, or MacPaint file. You can then paste it into your application or manipulate it with an appropriate graphics application.

- BackFAX can automatically generate a cover page for your fax documents, with your logo, address information and delivery instructions, and any other information you want to include with every fax you send.

Solutions International
30 Commerce Street
Williston, VT 05495-9957
(802) 658-5506

Maximum Cabling Distances

For best product performance, use the following guidelines to determine appropriate cabling distances:

- The maximum length for video cable between a Macintosh RGB monitor and a Macintosh II computer is 150 feet.

- The maximum length for a chain of SCSI devices is 20 feet, no matter how many devices are in the chain. If you have only two devices that you need to place 20 feet apart, connect several SCSI extender cables—each of which is approximately 3 feet long.

- RS-232/RS-422 cables should be no longer than 25 feet.

- The maximum length for a cable from a Macintosh computer to an Apple HD20 hard disk (not SCSI) is 30 inches.

- The maximum total length for LocalTalk™ cabling is 984 feet (32 nodes).

- The maximum total length for ADB (Apple Desktop Bus™) cable is 16 feet.

Using SCSI Terminators with a Macintosh and an SCSI Drive

When you connect one or more SCSI devices to a Macintosh computer, there must be at least one terminator between the Macintosh and the first SCSI device. You must put another terminator at the end of a chain of SCSI devices. If you're using a Macintosh II or a Macintosh SE with an internal drive, be aware that the drive itself is automatically terminated.

Macintosh Configuration	Location of Terminator
Macintosh Plus, SE, or II (no internal drive) + one external SCSI device	Before the external SCSI device
Macintosh Plus, SE, or II (no internal drive) + multiple SCSI devices	Before the first external SCSI device and at the end of the chain
Macintosh II/SE + internal drive	Not required
Macintosh II/SE + internal drive + one external SCSI device	Before the external SCSI device
Macintosh II/SE + internal drive + multiple SCSI devices	At the end of the chain

Many third-party external SCSI drives are internally terminated. If you're using a third-party drive in the middle of a chain, determine whether it has internal termination and, if so, either remove the terminator (following the procedure outlined in the vendor's documentation), or place the device last in the chain.

How to Format an MFS 400K Disk
on an HFS System

The Macintosh File System (MFS) was used in the Macintosh 128K and 512K computers. Most users are now familiar with the Hierarchical File System (HFS), introduced with later models of the computer. Disks formatted in the normal way with an HFS system will not work properly on an MFS machine. Follow the procedure below to use an HFS system to format a 400K disk for use on an MFS system:

1. Insert your unformatted disk.

2. When the dialog box presents you with a choice of "One-Sided" or "Two-Sided" format, click "One-Sided." This creates a 400K MFS disk.

You can tell if a disk is an HFS or MFS disk by looking at the left side of the double lines below the title bar after you open the disk icon. If there is a single dot between the lines on the left side of the window, the disk is an HFS disk.

LaserWriter IIsc and Screen Fonts

The LaserWriter IIsc printer can print any bit-mapped screen font, including those you design with font creation programs.

Because the LaserWriter IIsc prints at 300 dots per inch (four times the density of the dots on the Macintosh screen), it deliver best results with fonts four times larger than those displayed on the screen. Four sets of such fonts come with the LaserWriter IIsc; you install them in your System file.

However, if you don't have the proper 4X ("four times") font, the printer's Font Manager will look for the next best font to scale. ("Scaling" refers to the resizing, compression, or expansion of a character by QuickDraw.) The Font Manager looks for fonts in the following order:

1. A font twice the size of the desired 4X font
2. A font half the size of the desired 4X font
3. The next larger font
4. The next smaller font, or the screen font

When you don't have the appropriate 4X font, be sure to select Text Smoothing in the Page Setup dialog box.

Recommended Macintosh System Software Configurations

Macintosh Model										
System/Finder	128K	XL	512K	512K Enhanced	Plus	SE	SE/30	IIcx	II	IIx
2.0/4.1	◆									
3.2/5.3		◆	◆	◆	▲					
3.3/5.4			▲	▲	▲					
4.0/5.4				✔	▲	▲			▲	
4.1/5.5				✔	▲	▲			▲	
4.2/6.0					▲	▲			▲	
6.0.2					◆	◆			◆	▲
6.0.3					◆	◆	!	!	◆	◆

✔ = Best system software for the CPU
▲ = OK, but not optimal
◆ = Best for use with a network
! = Required for use with the CPU

Note: This information refers to hardware requirements only. Application software may dictate other needs.

Macintosh System Software is available through the Apple Software Update Program or from your authorized Apple dealer or Apple sales representative.

Current Apple Upgrades and Updates

An **upgrade** enhances features of existing hardware or software. Generally, an upgrade involves a fee, and any additional Apple hardware must be installed by an authorized Apple service provider.

A software **update** consists of enhancements, fixes, or patches to software. An update to Apple software is handled through an authorized Apple dealer or your Apple sales representative.

Following is a summary of the Apple upgrades and updates currently available for Macintosh products.

Macintosh 128K, 512K Upgrade to Macintosh Plus

Owners of Macintosh 128K and Macintosh 512K computer can upgrade to the Macintosh Plus. The upgrade consists of the Macintosh Plus Disk Drive Kit (part number M2516) and the Macintosh Plus Logic Board Kit (part number M2518/A).

Macintosh SE/30 Logic Board Upgrade

Owners of 1-megabyte or 4-megabyte Macintosh SE computers can upgrade to the Macintosh SE/30 by purchasing the Macintosh SE/30 Logic Board Upgrade (part number M0713). Owners who have a 2-megabyte or 2.5-megabyte Macintosh SE must purchase an additional 2 megabytes of memory to use the upgrade. Systems that have two internal 800K drives must have one drive removed. Macintosh System Software Version 6.0.3, required by the Macintosh SE/30, is included with the upgrade. For further details, see "Macintosh SE/30 Logic Board Upgrade" on page 12.

Macintosh II Upgrades

The ROM upgrade for the Macintosh II enables the Macintosh II to recognize more than 1 megabyte of address space on a NuBus™ card.

Macintosh II users who want to achieve full system equivalence with the Macintosh IIx system can do so by replacing the Macintosh II logic board with the Macintosh IIx Logic Board Upgrade (part number M0271) and the FDHD Macintosh II Upgrade Kit (part number M6051).

LaserWriter IIsc Upgrades

To upgrade the LaserWriter IIsc printer to the LaserWriter IINT, purchase the LaserWriter IINT Controller Card (part number M6009). To upgrade the LaserWriter IIsc to the LaserWriter IINTX, use the LaserWriter IINTX Controller Card (part number M6004).

LaserWriter to LaserWriter Plus (LaserWriter Plus Kit)

To upgrade the LaserWriter printer to a LaserWriter Plus, an authorized Apple service provider installs 1 megabyte of ROM. The customer then installs new screen fonts using the printer installation disk (supplied).

LaserWriter PostScript Upgrade Program (LaserWriter Plus Kit)

To upgrade LaserWriter Plus ROMs to PostScript version 47, an authorized Apple service provider installs the LaserWriter Plus Kit.

LocalTalk PC Card ROM Upgrade

Apple has revised the ROM on the LocalTalk PC Card to upgrade the ROM Checksum. This upgrade improves compatibility with various software packages, and is available free of charge.

AppleScan Version 1.0.2

In addition to fixing a number of minor bugs, AppleScan 1.0.2 offers more control over Preview, improved compatibility with the AppleFax Modem, and improved transfer of PICT files. Version 1.0.2 of the AppleScan software is available free of charge.

AppleFax Firmware Version 1.2

AppleFax Firmware 1.2 fixes specific incompatibility problems with some Group 3 facsimile machines and certain phone systems, particularly Private Branch Exchange (PBX) phone systems. Version 1.2 of the AppleFax firmware is available free of charge.

AppleFax Software Version 1.2

Version 1.2 of the AppleFax Modem application and the AppleFax Modem Resource contains a number of improvements over Version 1.1, including compatibility with System Software 6.0.3, an end to "character collisions," and improved performance of the "in care of" feature. Version 1.2 of the AppleFax software is available free of charge.

MacTerminal Version 2.3

This MacTerminal® software update is available free of charge. The new version features full MultiFinder software compatibility and an improved user interface.

Claris Software

For information about upgrades and updates to the Claris MacWrite, MacPaint, MacDraw, and MacProject programs, please contact:

Claris Corporation
440 Clyde Avenue
Mountain View, CA 94043
1-800-544-8554
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Macintosh Technical Bulletin

Technical Bulletin Subscriptions now Available as a Separate Product

Apple Technical Bulletins are bimonthly publications designed to provide timely and useful technical information to Apple II and Macintosh users, particularly those who provide technical support to other users. Articles about new products, compatibility and connectivity issues, "power user" features, and product updates and upgrades help you use your Apple hardware and software more effectively and efficiently. Two editions are available for an annual subscription price of $129 each: the *Apple II Technical Bulletin* (order number B0134LL/A) and the *Macintosh Technical Bulletin* (order number B0133LL/A).

Each edition is published six times a year, and each issue is approximately 36 pages long. Subscribers also receive the full text of each issue on disk. A storage binder is included.

Apple Technical Bulletins are available as a separate product or as part of the Apple Software Update Program. For more information, contact your authorized Apple reseller or Apple sales representative.

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